IAQ & Schools:

Creating An Indoor Environment That Is Truly A Learning Environment

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Overview:

- Current condition of schools and occupants
- Mechanics of “how we learn”
- What is “Indoor Air Quality”
- Does Poor IAQ Affect Student Performance?
- How Do We Improve IAQ?

Review: School Facts

- Average age of U.S. schools: 42 years
- 1 in 5 Americans in school buildings each day
- EPA: Half of schools have ventilation issues
- Estimated cost to repair schools: $127 - $248 Billion
- 75% of schools have outlived their predicted life

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Review: School Facts

- Asthma has reached epidemic proportions in U.S.
- 1 in 13 school-aged children has asthma
- Asthma is leading cause of absenteeism

How do we learn?

- Learn by repetition / regular attendance in the classroom

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- Concentration / lack of distraction

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What is IAQ?

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- Particulates
- Mold
- Formaldehyde & other VOCs
- Ozone
- MCS vs. BRI vs. SBS

Causes of SBS

- Inadequate ventilation
- Chemical contaminants from indoor sources
- Chemical contaminants from outdoor sources
- Biological contaminants

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Solutions to SBS

- Pollutant source removal or modification
- Increasing ventilation rates
- Air filtration

Balancing Energy and IAQ

- Fan horsepower
- System pressure
- Free cooling opportunities
- Innovative solutions

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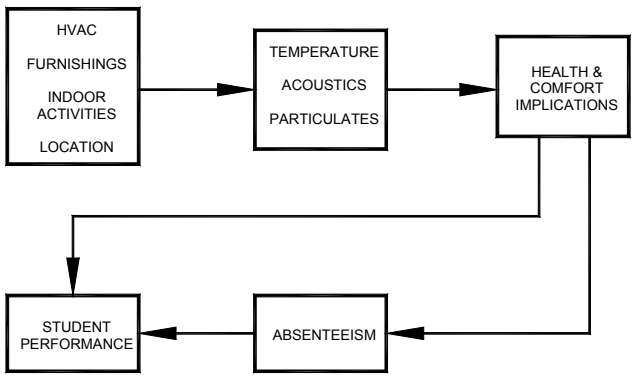
Does Poor IAQ Affect Student Performance?



Does Poor IAQ Affect Student Performance?

- Temperature Control
- Past: viewed as a "matter of comfort"
- Present: classified as an environmental stressor
- New research: temperature–performance link

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How do we articulate issues of IAQ and Schools?

- Engineering
- Capital & Operating Cost
- Biology & Physiology
- Student Performance: Test Scores
- Human Resources (Recruitment / Retention)
- Legal / Liability Aspects

Conclusion:

•Re-visit our mission in designing schools

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Conclusion:

- Re-visit our mission in designing schools
- Good engineering design must include proper commissioning and periodic re-commissioning
- Must use best available technology to ensure energy efficiency and good IAQ